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Zero Discord leads to Completely Positive Maps CESAR RODRIGUEZ, KAVAN MODI, AIK-MENG KUAH, Univ. of Texas at Austin, ANIL SHAJI, Univ. of New Mexico at Albuquerque, E.C.GEORGE SUDARSHAN, Univ. of Texas at Austin — The stochastic evolution of a quantum system can be expressed by a dynamical map that acts as a superoperator on a density matrix. If all eigenvalues of this map are positive, the map is said to be completely positive. If the dynamical map comes from the reduced unitary evolution of a bipartite system, the map depends on the correlations, and can have negative eigenvalues. Quantum discord is a measure of the quantumness of a correlation. A state with zero discord has the properties that the only correlations that it has are equivalent to the classical conditional probability. We prove that states with zero quantum discord always lead to completely positive maps. The connection with the proper preparation of states for experiments is made.

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